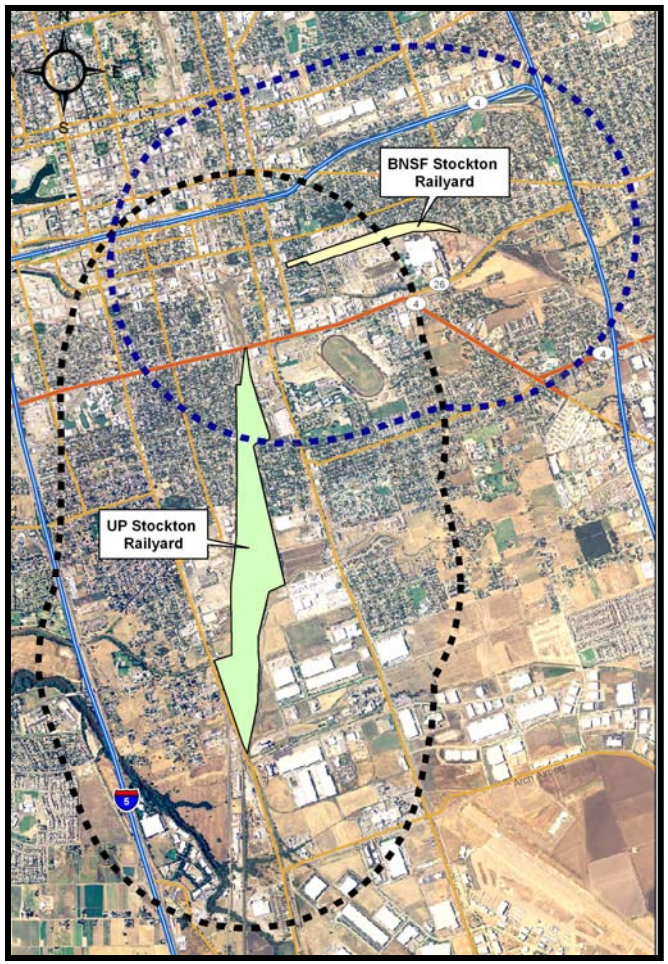
Draft ARB Health Risk Assessments for the Stockton Railyards



California Environmental Protection Agency

Air Resources Board

Tonight's Presentation

- Process
- Background
- Methods and Results
- Actions Taken to Reduce Health Risks
- Answer Questions, Discuss Next Steps

Meeting Purpose
Public Review Period

Process to Review Risk Assessment and Plan Next Steps

- **Tonight's Meeting has Several Purposes**
  - Present our Analyses and Explain Results
  - Discuss Progress Being Made
  - Answer Your Questions
  - Initiate Process for Review and Comment
- **After Tonight's meeting There Will Be:**
  - Opportunity for comments, both in writing and at second community meeting in 45 days
  - Consultation to obtain your ideas on possible future emission reduction actions by either the ARB or the railroads

Health Risk Assessment Timelines

Draft Health Risk Assessments to be Completed by *Spring 2007*		Draft Health Risk Assessments to be Completed by *the end of 2007*	
Railyard	**Company**	**Railyard**	**Company**
Commerce/Eastern	BNSF	Barstow	BNSF
Hobart	BNSF	San Bernardino	BNSF
Richmond	BNSF	San Diego	BNSF
Stockton	BNSF	Colton	UP
Wilmington (Watson)	BNSF	Dolores (ICTF)	UP
Commerce	UP	Industry	UP
LATC (Los Angeles)	UP	Oakland	UP
Mira Loma	UP		
Stockton	UP		

BACKGROUND

Background

- **This Effort is part of our commitment to address pollution impacts on communities**
  - Implements the ARB Goods Movement Plan
  - Required by the ARB/UP/BNSF Railroad Agreement
- **The State's Goals are to:**
  - Reduce exposure to toxic diesel PM as quickly as possible
  - Reduce risks by at least 85 percent by 2020
  - Obtain the emission reductions need to attain air quality standards

Purpose of the Assessments

- Identify pollution sources in the railyards
- Determine exposures to the public
- Estimate the health risks
- Put the railyard risks into perspective with other sources
- Provide information needed to reduce the risk

Scope of the Draft Assessments

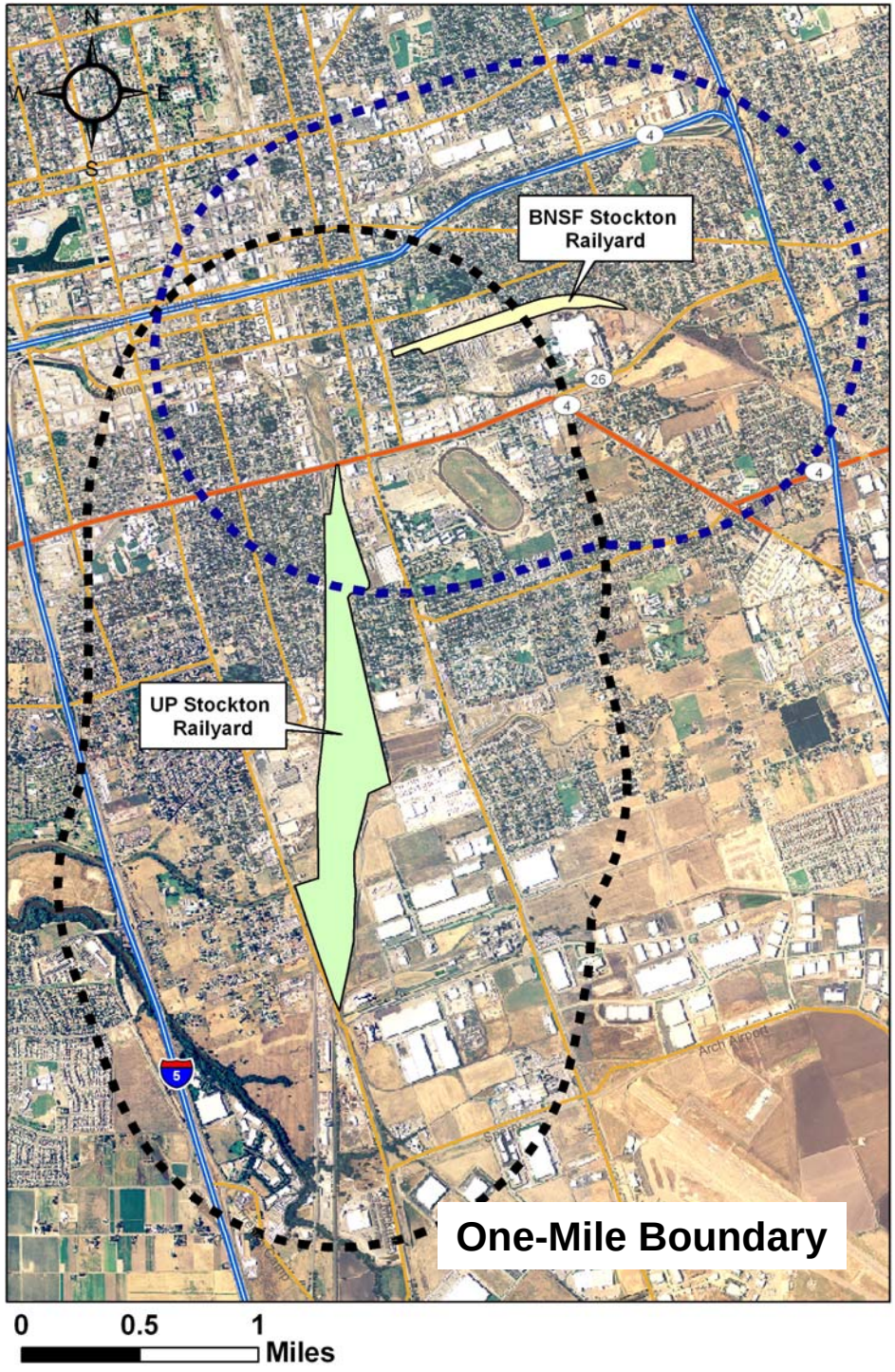
- **Two major parts:**
  - Health risk assessment for the railyard
  - Health risk assessment for significant diesel sources surrounding the community
- **Separate report for each railyard**
- **Combined report for the four Commerce railyards**
- **Focus on diesel PM; other toxic sources evaluated, but small relative to diesel PM**

Methodology for Preparing the Draft Assessments

Railyard Risk Assessment Methodology

- Prepare the best possible emissions inventory
- Complete air dispersion modeling
- Provide estimates of health risks
- Determine other sources of risks

Area of Study
Two Stockton Railyards



Railyard Emissions

Diesel PM Emission Inventory

- **Locomotives (line-hauls, switchers, & services)**
- **On-road trucks & vehicles**
- **Cargo handling equipment**
- **Off-road equipment**
- **Stationary Sources (point & area)**

Estimating Emissions

- Fleet/Equipment population
- Operational activity
  - Hours of operation
  - Load factor
  - Vehicle miles traveled (VMT)
  - Hours per day
- Emission factors
- Fuel characteristics
  - Fuel usage
  - Sulfur content

Example - Locomotive Emissions

- Number of locomotives by class
- Time operating at each notch setting and in idle mode
- Emission factors by locomotive type and mode (notch setting/idling)
- Hours of operation in each mode
- Types and amount of fuel used

Summary of Stockton Railyards Diesel PM Emissions

RAILYARD SOURCES	UP Stockton	BNSF Stockton	Total
LOCOMOTIVES	**6.5**	**3.5**	**10**
Line-haul	2.1	1.8	3.9
Switcher	3.6	1.6	5.2
Service	0.8	0.1	0.9
ON-ROAD TRUCKS	**0.2**	**n/a**	**0.2**
OTHERS	**0.2**	**0.02**	**0.2**
TOTAL	**6.9**	**3.5**	**10.4**
% of Total	**66%**	**34%**	**100%**

Prepare Non-Railyard Emission Inventories

- Focus on diesel PM sources
- Identify the population of trucks on roads
- Apply specific emission factors to the trucks
- Calculate emissions

Summary of Nearby Non-Railyards Diesel PM Emission Inventory

Sources	Tons per year
Mobile Sources	9.97
Stationary Sources	0.05
TOTAL	**10**

Comparison of Diesel PM Emissions

(tons per year in 2005)

Sources	Locomotive	Cargo Handling Equipment	On-Road Trucks	Other (Refrigerator truck, Off-road, Trailers , etc)	Total
San Joaquin Valley Air Basin	n/a	n/a	n/a	n/a	**4,000**
Combined Stockton Yards	10	0	0.2	0.2	**10.4**
UP Stockton	*6.5*	*0*	*0.2*	*0.2*	***6.9***
BNSF Stockton	*3.5*	*0*	*0*	*<0.1*	***3.5***
Nearby Roadways	--	--	10	--	**10**

Complete Air Dispersion Modeling

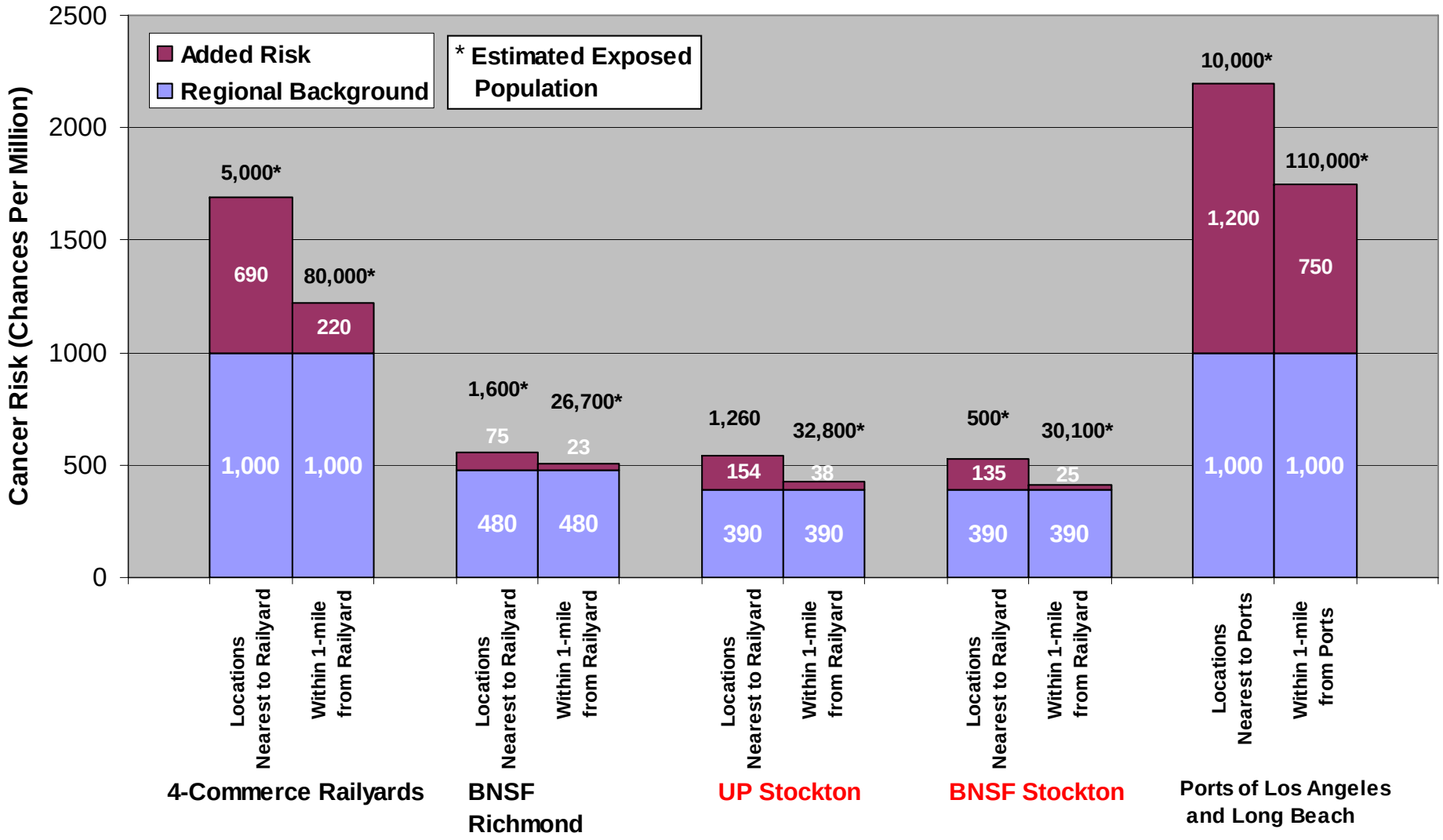
- Use air quality modeling to estimate the amount of diesel PM in the air surrounding a source
- Express results as a “concentration” in units of micrograms per cubic meter of air
- Use U.S. EPA-approved computer models
- Major inputs to the model:
  - Emissions inventory
  - Meteorological data (wind speed/direction, temperature, etc.)

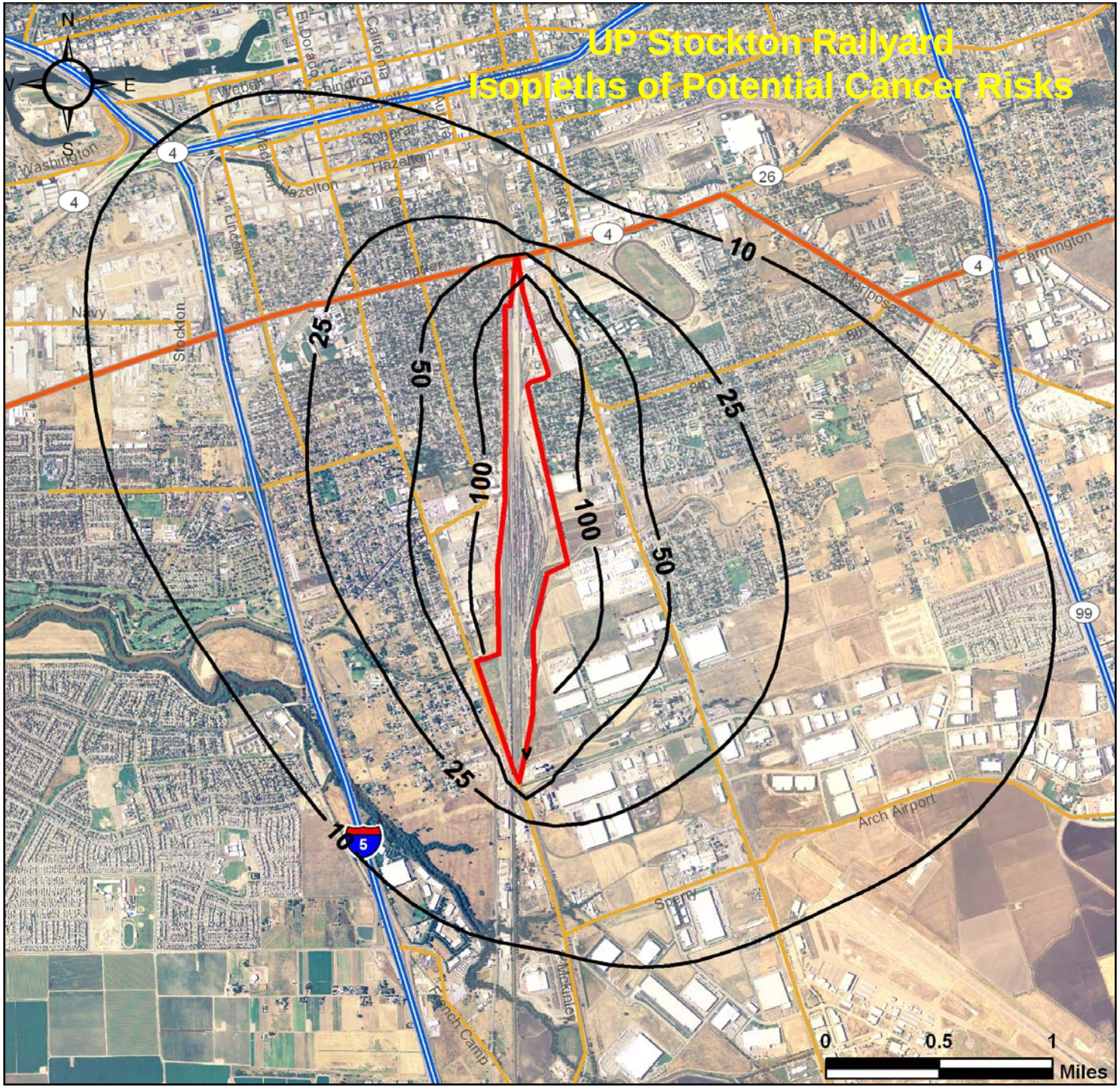
Estimate Health Risks

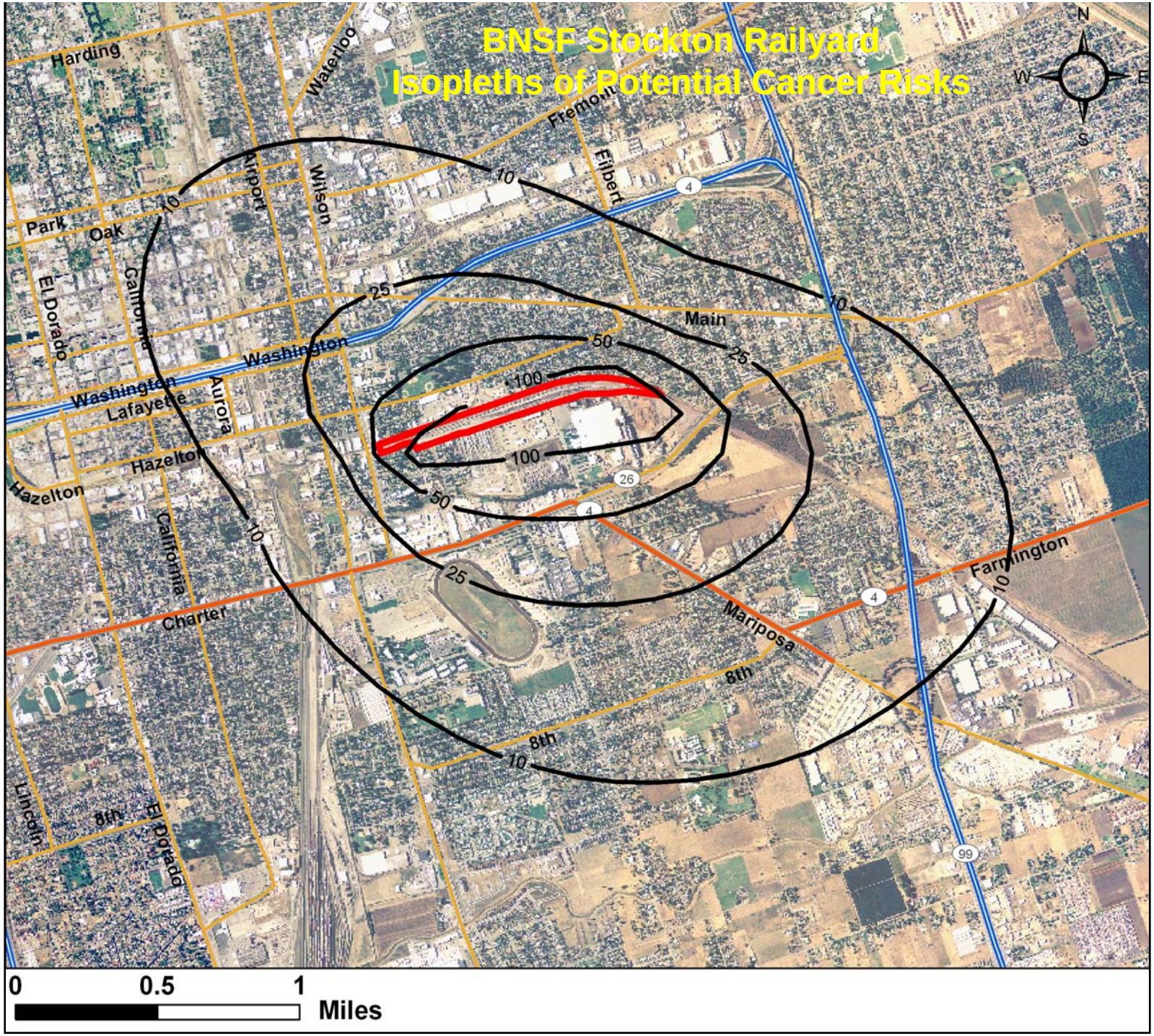
- Combine air dispersion modeling results with toxicity data to estimate health risks
- Determine risks for cancer and non-cancer effects
- Express results as chances per million for cancer and a “hazard index” for non-cancer impacts
- Use toxicity data provided by the California Office of Environmental Health Hazard Assessment
- No significant impacts on the communities identified for non-cancer effects

Results of the Draft Assessments

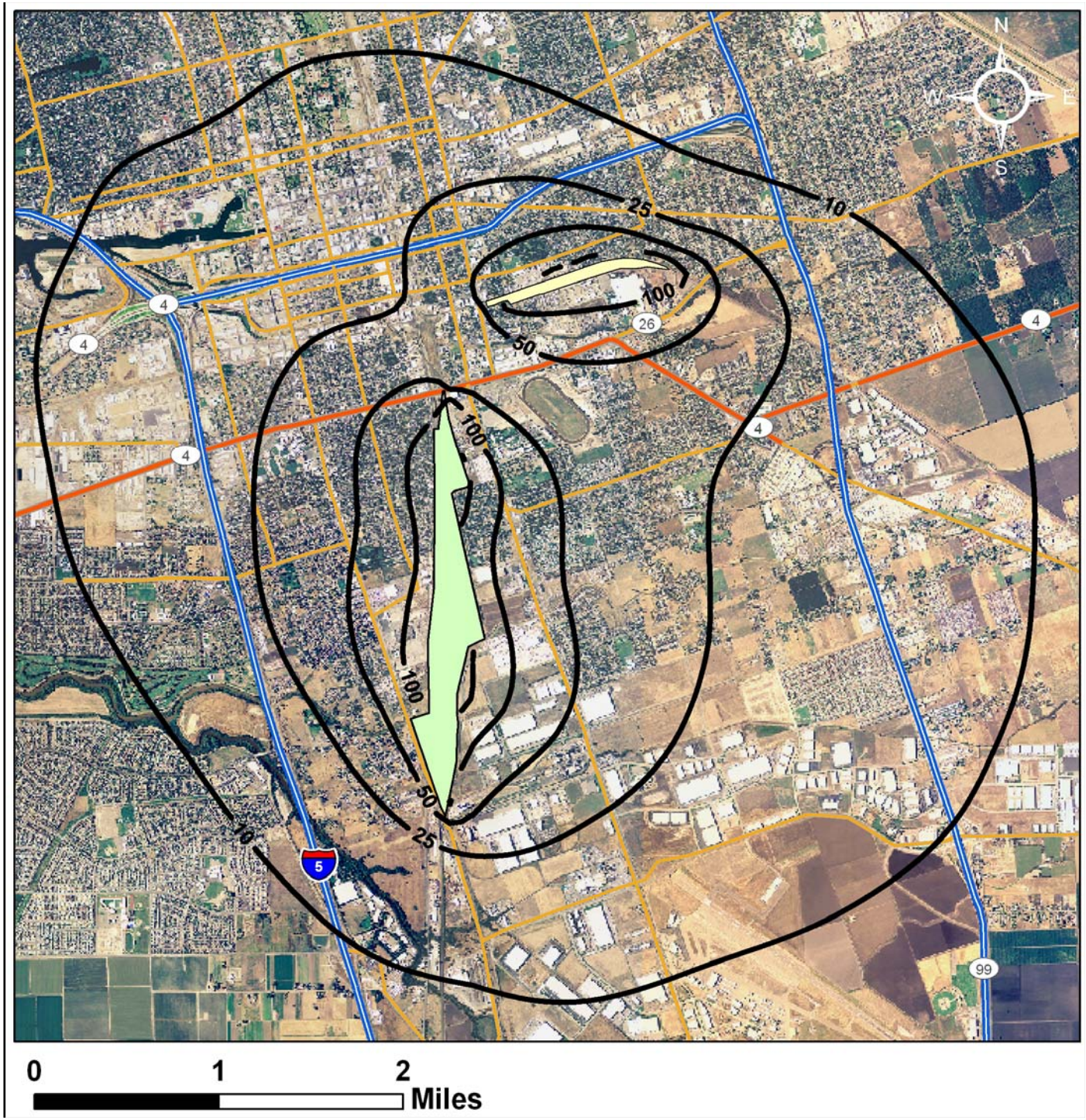
Two Stockton Railyards Estimated Potential Cancer Risks

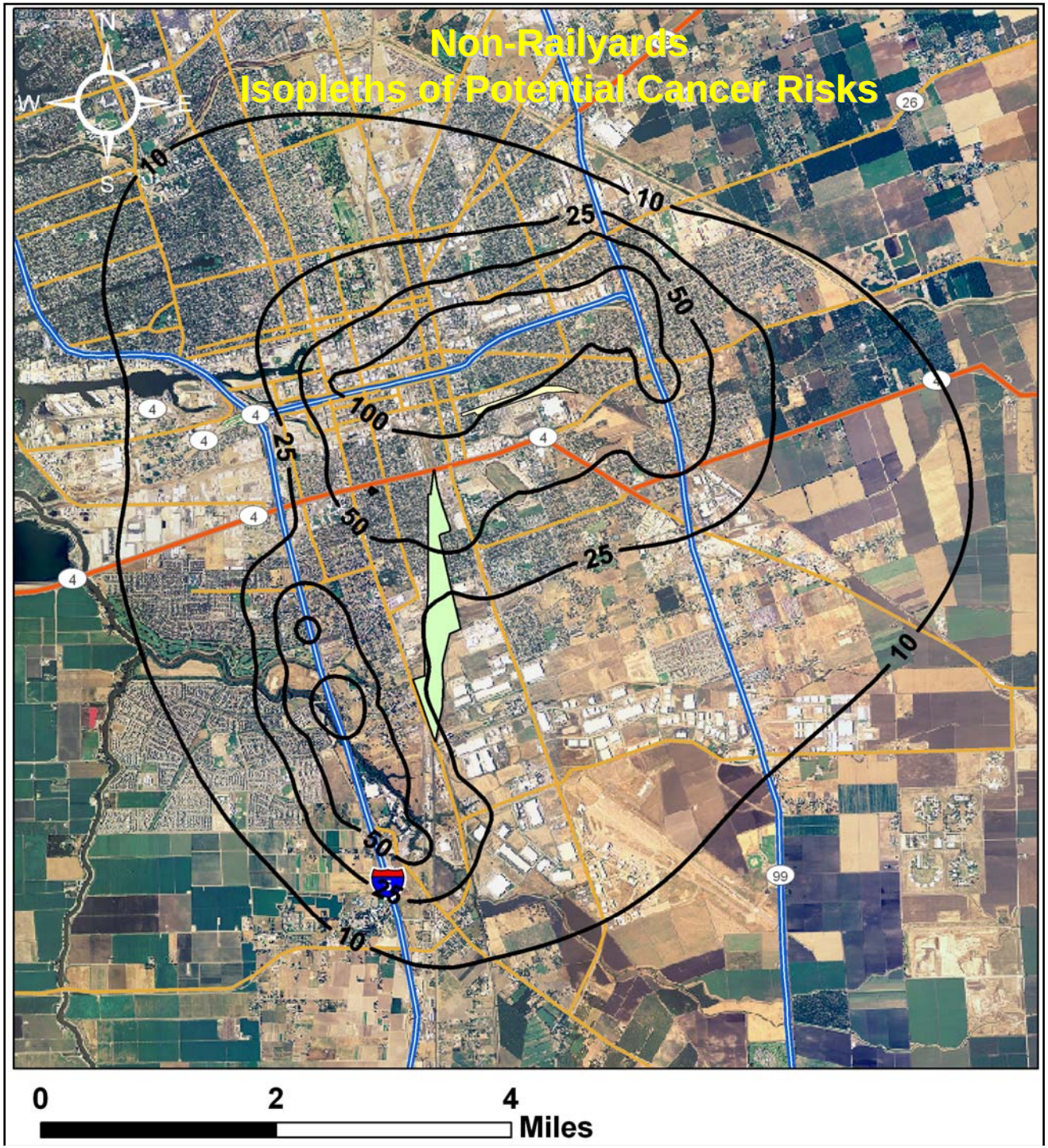



UP Stockton Railyard
Isopleths of Potential Cancer Risks
N
W
E
S
10
25
50
100
100
50
25
10
Arch Airport
Farmington
Hazelton
Navy
Stockton
Sperry
Mckinley
French Camp
Washington
0
0.5
1
Miles


BNSF Stockton Railyard
Isopleths of Potential Cancer Risks
N
W
E
S
Harding
Waterloo
Fremont
Wilson
Airport
Elbert
Park
Oak
El Dorado
California
Main
Washington
Lafayette
Aurora
Hazelton
Charter
Mariposa
8th
Farmington
Lincoln
10
25
50
100
4
26
99
0
0.5
1
Miles

Two Stockton Railyards Isopleths of Potential Cancer Risks




Non-Railyards
Isopleths of Potential Cancer Risks
N
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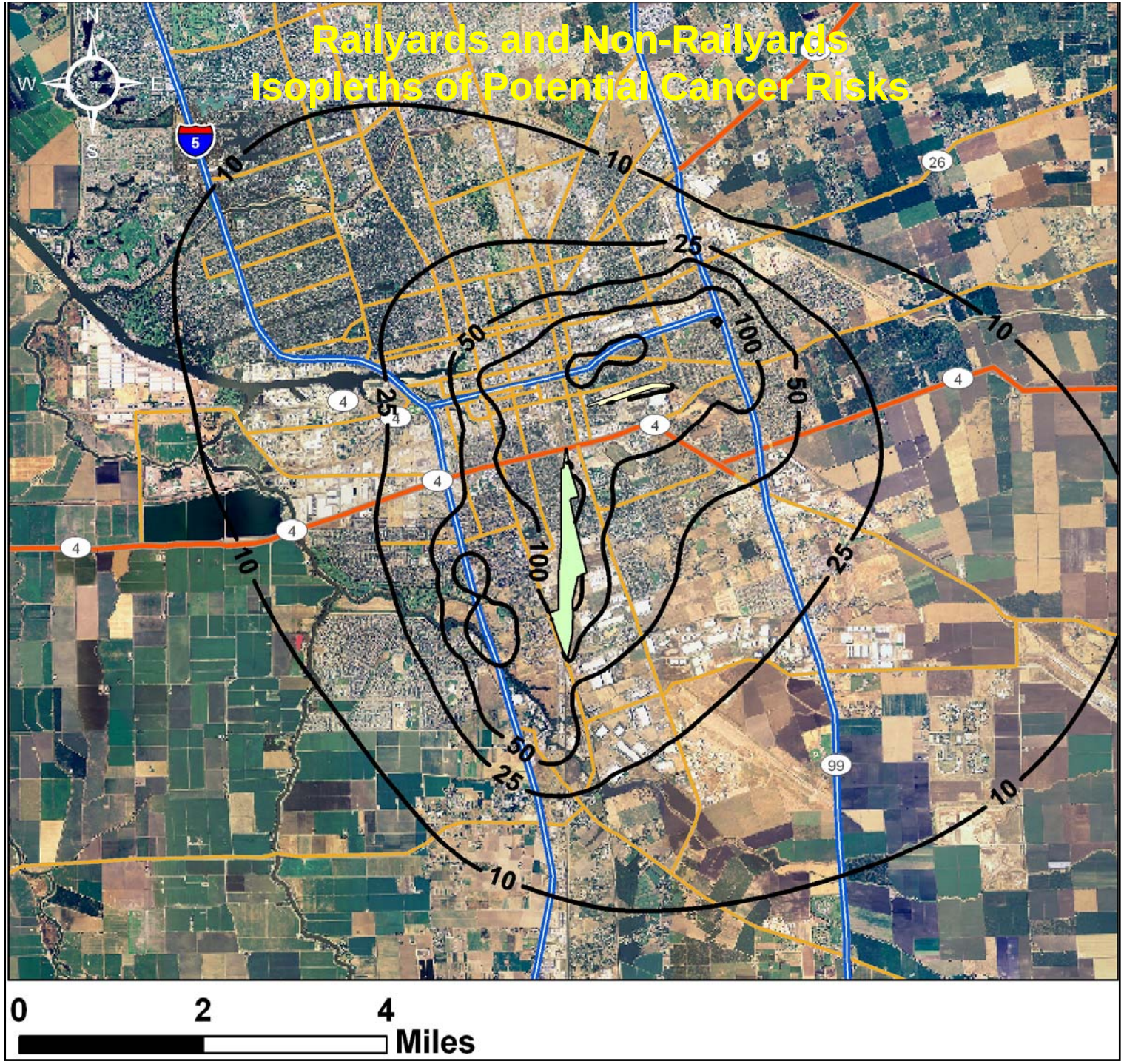
10
25
50
100
4
26
99
0
2
4
Miles


Railyards and Non-Railyards
Isopleths of Potential Cancer Risks
N
W
E
S
5
99
26
4
10
25
50
100
0
2
4
Miles

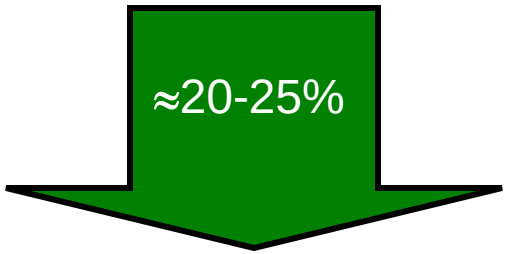
Emission Reduction Measures

Approach to Reducing Emissions

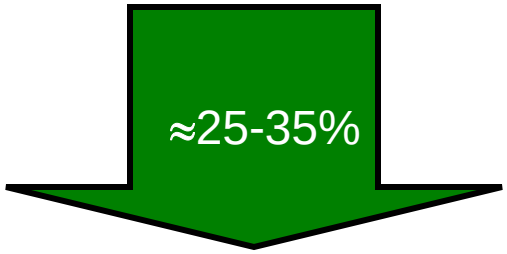
- ARB regulations
  - Fuels
  - Cargo handling equipment
  - Transport refrigeration units
  - Heavy-duty diesel on-road trucks and off-road vehicles
- U.S. EPA regulation
  - Locomotives
- Voluntary agreements
  - 1998 South Coast/2005 Statewide
- Railroad yard locomotive replacement program
- Funding programs
  - Carl Moyer Incentives

Benefits of California Railyard Diesel PM Emission Reduction Measures

- **2005-2007:**
  - CARB diesel fuel for intrastate locomotives
  - 2005 railyard agreement



- **2005-2010:**
  - Measures above plus:
  - Spilled-over benefits from 1998 NOx locomotive fleet average agreement (South Coast)
  - ARB on-road heavy-duty truck regulation
  - ARB transport refrigeration unit regulation

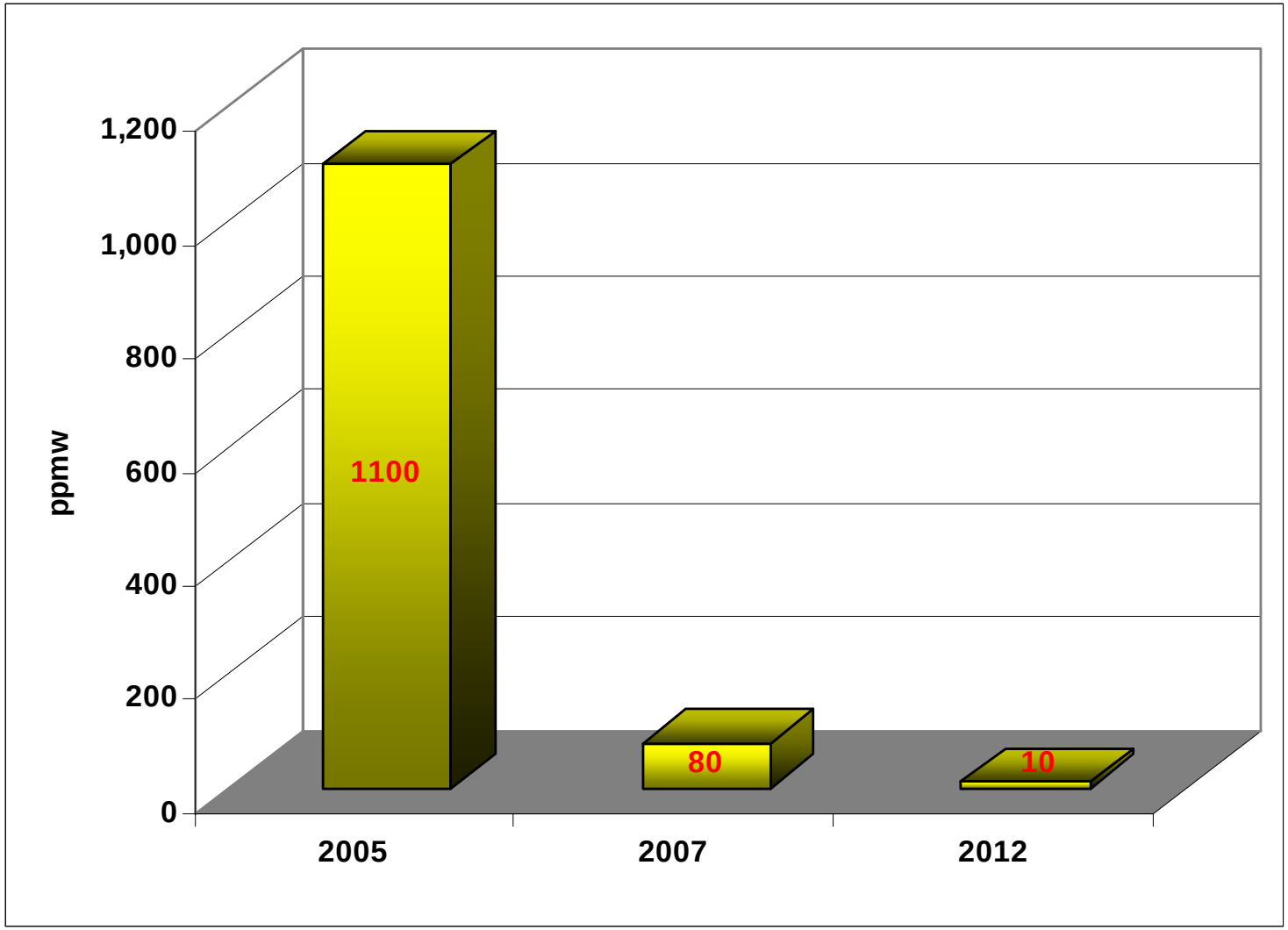


Progress Report - Existing Measures
Diesel Fuel Standards

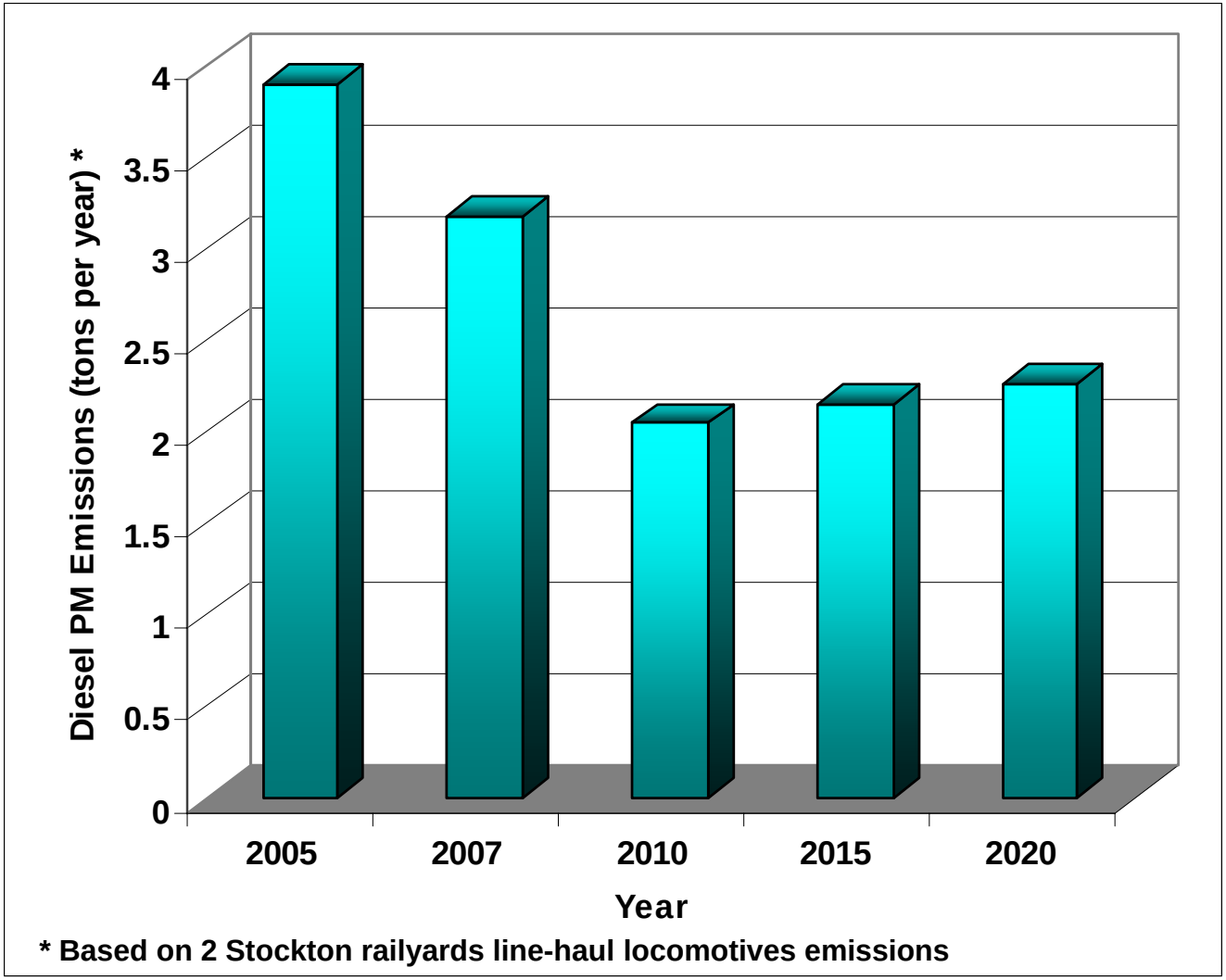
Fuel Type	Maximum Sulfur Level (ppmw)		Aromatics Maximum (% by volume)
	Prior	2006-2007	
CARB Diesel	500	15	10
EPA On-Road Diesel	500	15	35
EPA Non-road Diesel	5,000	500*	35

* Lower to 15 ppmw in 2012.

Progress Report - Existing Measures
Average Diesel Fuel Sulfur Levels Consumed by Locomotives in California

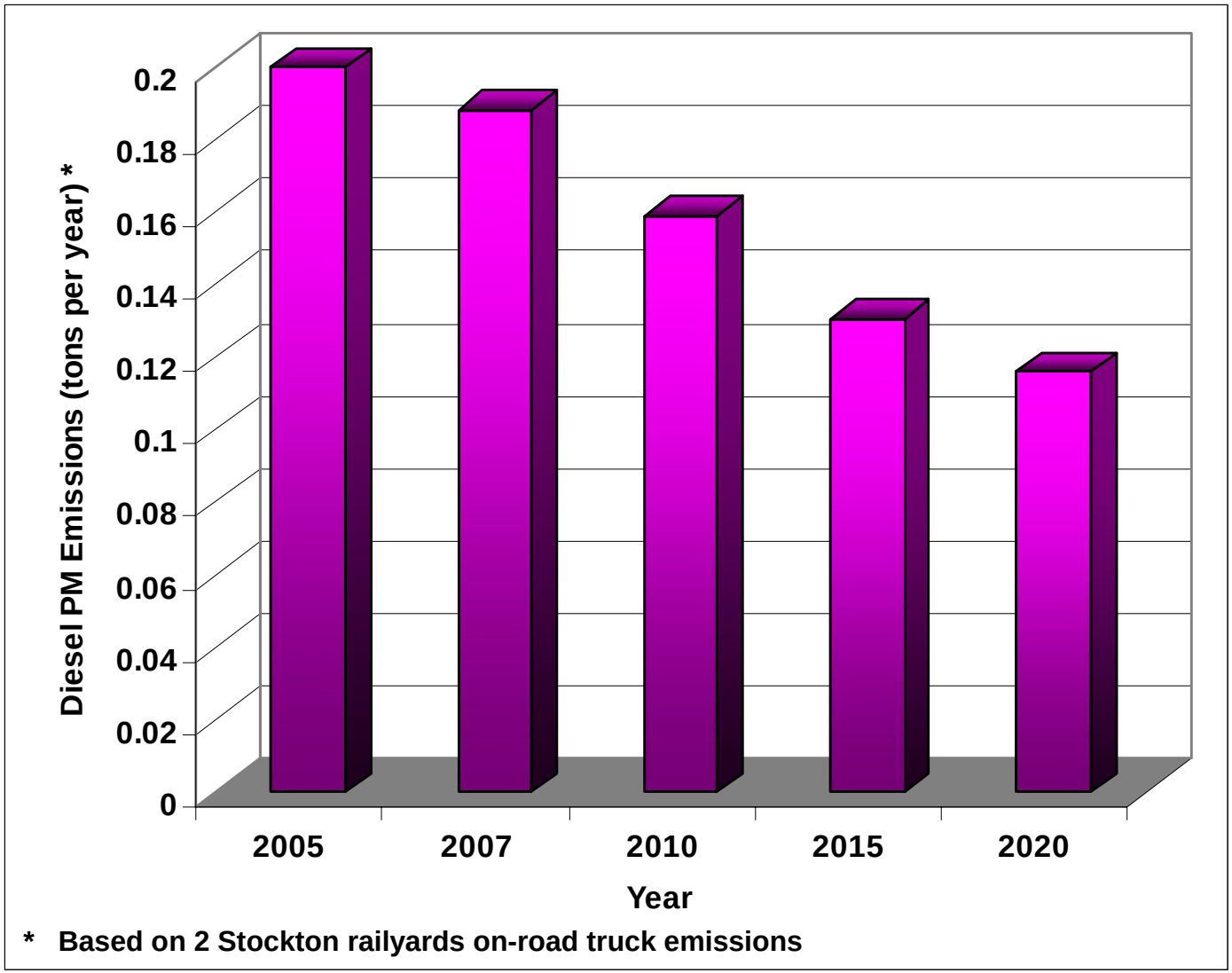


Progress Report - Existing Measures
Two Stockton Railyards Diesel PM Emission Reductions: Line-Haul Locomotives



* Based on 2 Stockton railyards line-haul locomotives emissions

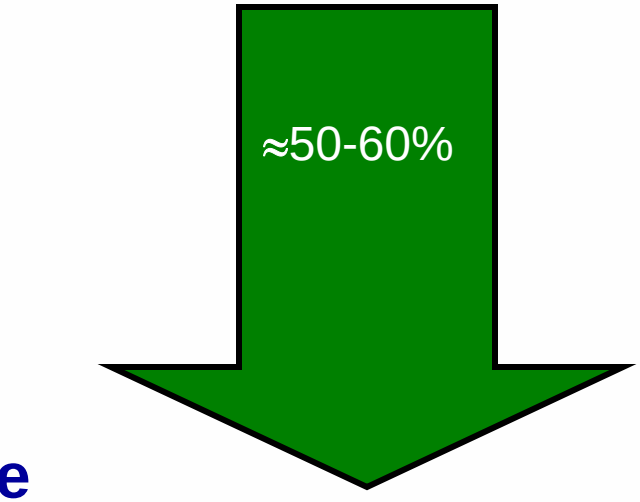
Progress Report – Existing Measures
Two Stockton Railyards Diesel PM Emission Reductions: New On-Road Trucks



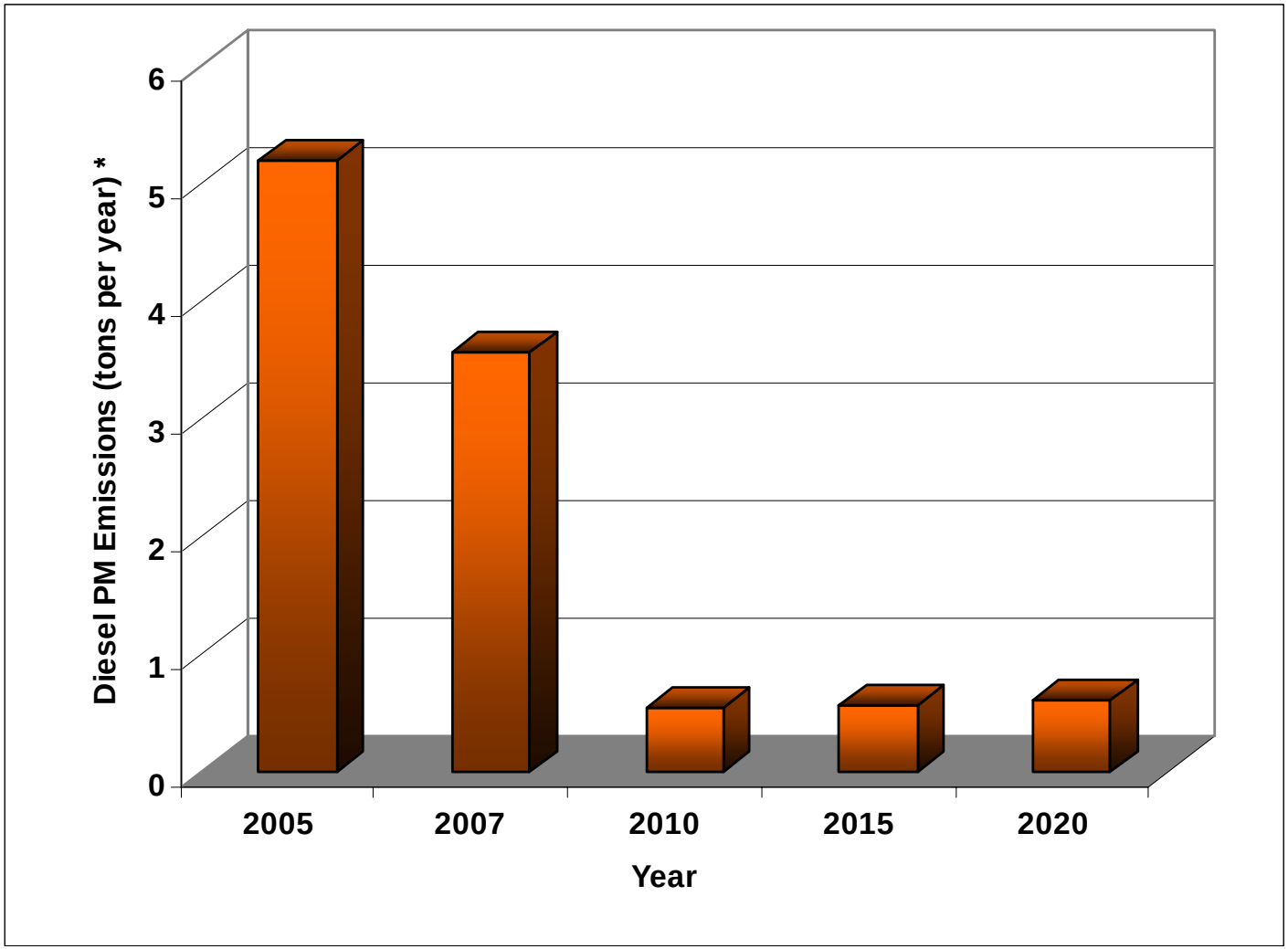
* Based on 2 Stockton railyards on-road truck emissions

Possible Additional Measures

- **2005-2020:**
  - **U.S. EPA locomotive rulemaking**
  - **California replacement of switch locomotives**
  - **ARB in-use truck measure**

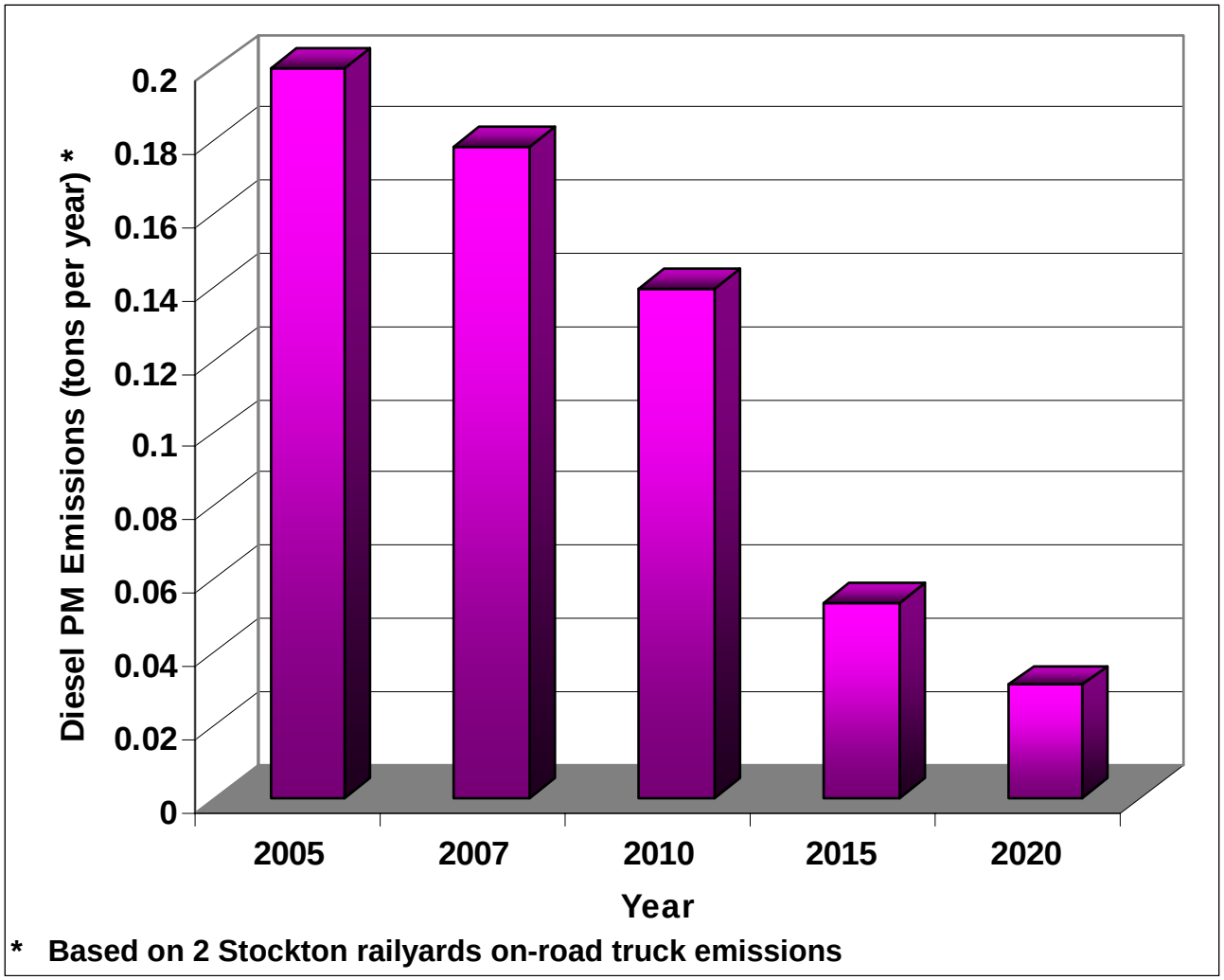


Progress Report – Potential Measures
Stockton Railyards Diesel PM Emission Reductions: Switcher Locomotive Replacement by 2010



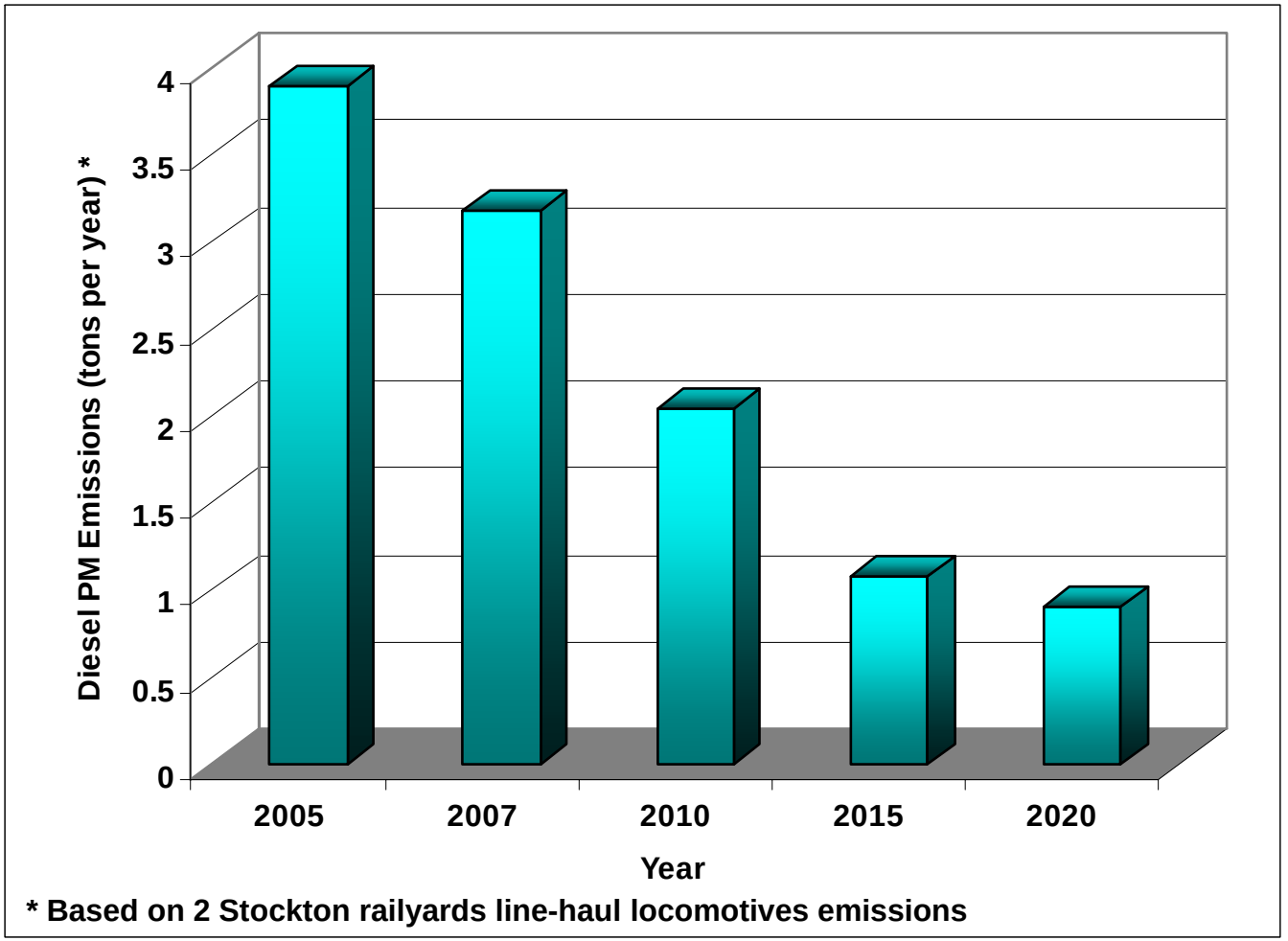
*** Based on two Stockton railyards switcher locomotives emissions**

Progress Report - Potential Measures
Stockton Railyards Diesel PM Emission Reductions: In Use On-Road Trucks



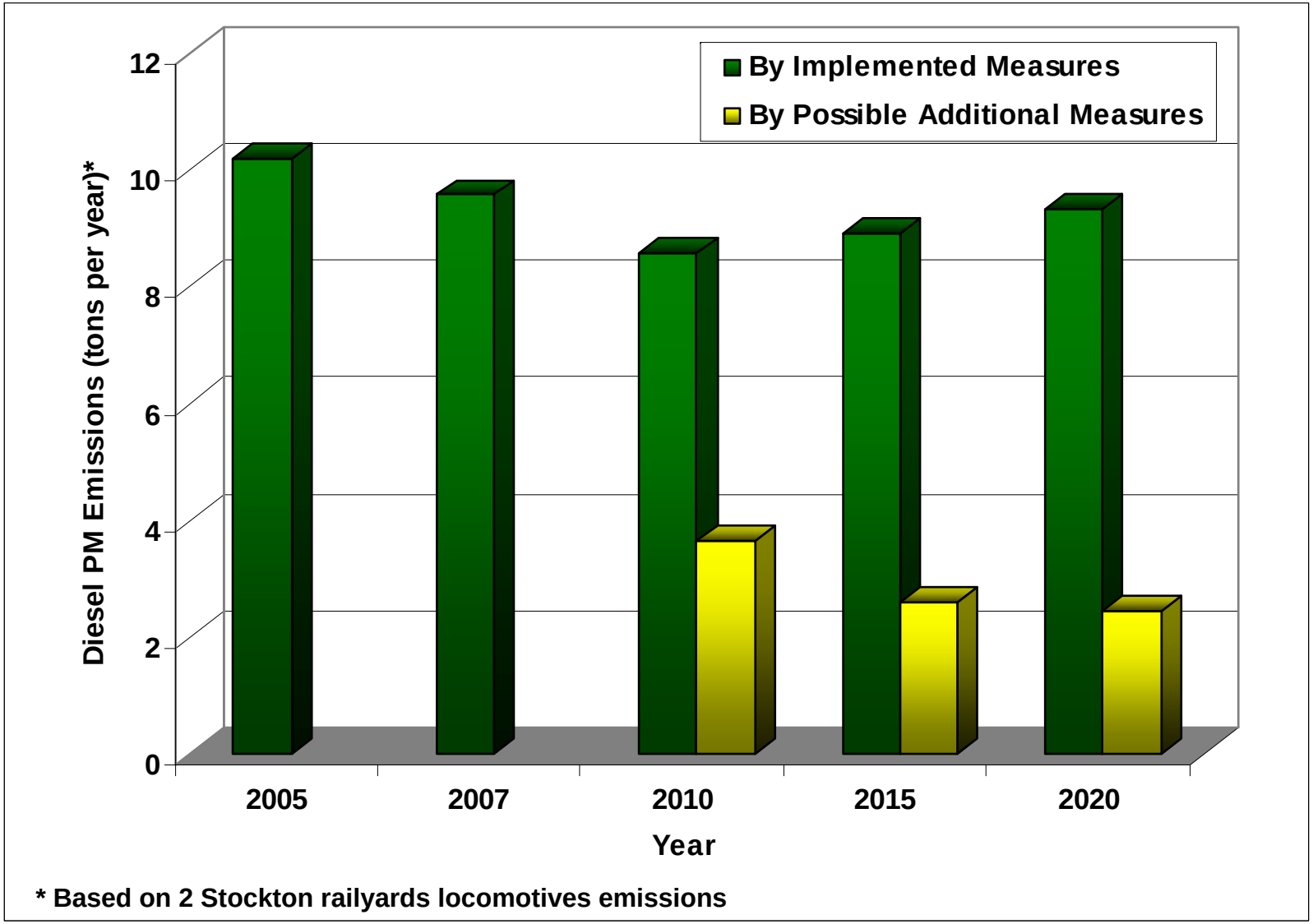
- In addition to the existing **on-road heavy-duty truck regulation.**

Progress Report - Potential Measures
Stockton Railyards Diesel PM Emission Reductions:
U.S. EPA Locomotive Rulemaking



- In addition to the existing Line-haul locomotive **fleet average agreement .**

Progress Report - Existing + Potential Measures
Total Benefits of the Emission Reductions Measures for Stockton Railyards



* Based on 2 Stockton railyards locomotives emissions

Next Step

- Public Comment Period.
- Next Community Meetings.

Next Steps

- Begin public comment period
- Review the draft assessments
- Submit written comments to ARB
- Hold next series of community meetings
- Meet with interested stakeholders
- Evaluate any additional feasible mitigation measures

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  - **http://www.arb.ca.gov/railyard/hra/hra.htm**